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Extended abstract

Local citizen initiatives and transitions to energy sustainability

Picture an evening in a Dutch home in a quiet village, a group of dedicated people is seated around the kitchen table, discussing opportunities to transform their village into a low carbon or energy neutral community. Benefits will include local revenues, employment, social cohesion and clean air. Another scene is located in the boardroom of a fossil energy company, worried that prosumers and an avalanche of renewable energy production units will render their coal- or gas fired power plants unprofitable and hence obsolete.
The energy transition requires the transformation of communities and neighbourhoods. It will have huge ramifications throughout society. Many cities, towns and villages have put together ambitious visions about how to achieve e.g. energy neutrality, zero-emission or zero-impact. How realize these ambitions?
A relatively new phenomenon is that citizens take energy in their own hands, not only individually but also increasingly by establishing local energy initiatives. Indeed, a paradigm shift appears to occur in energy production and consumption, from large centralized fossil energy plants to diversified decentralized sustainable production. More and more consumers produce at least part of their own energy; the affix ‘prosumers’ is used to describe this development of decentralized energy production. Local Energy Initiatives foster and stimulate this development.
Our central question is: Is a locally governed, decentralized sustainable energy production a feasible alternative to the present centralized grid-connection energy system?
In this set of case study’s we investigate the following questions: How are these self-organized groups performing their self-set tasks? What obstacles are present in the current societal set-up that can hinder this paradigm shift, such as the vested interests of large energy companies?
We study local energy initiatives in different research projects. The case studies presented in this paper are part of the following projects:
In the MACREDES project (workpackage IIb) we engage in several case studies of local energy initiatives, concentrating on organisation models, leadership and team effectiveness. We make an inventory of different organisation models of local initiatives;
In the Energy Plus Communities project we investigate the relation between social cohesion and the realization of community energy ambitions and evaluate differences in technical and spatial approaches.
The case studies primarily focus on the local energy initiatives, their ambitions, activities, and organization. The initiatives are all located in the north of the Netherlands. In the past two years fieldwork and interviews have been undertaken to investigate local energy initiatives. These community groups have diverse backgrounds, ranging from political parties, commercial ventures, and energy cooperatives, to Village Working Groups. However, they converge as to their goal of promoting local energy production.
A key concept in our theoretical framework is *agency* and what citizens can do to change a system. How can these initiatives be effective? What factors influence their success or failure?

The case studies are analysed with theoretical concepts derived from literature on the energy transition, non-profit organisation, teamwork and sustainable leadership. For example, we categorize the initiatives according to the model of Walker et al. who argue that degrees of ‘collectiveness’ and ‘openness’ are important factors influencing the acceptance of new sustainable energy production units. As such, we will ascertain if these factors can be witnessed in the Dutch energy initiatives as well. In addition, we focus on factors that determine if the implementation of sustainable energy measures has a chance to succeed. Here, we depart from Nijkamp´s ‘pentagram for sustainable cities’. This pentagram points to the factors that have to be taken into account when implementing sustainability in cities. These factors are technology (‘hardware’); communication (‘software’); social conditions (‘ecoware’); financial requirements (‘finware’) and organization (‘orgware’). We combine the approaches of Walker and Nijkamp with actor-network theory in a conceptual model that is used to analyse local energy initiatives in the Netherlands.
In our model we identify ‘local networks’, where team effectiveness and the level of activities and communication are important factors. These local networks are embedded in a wider environment or ‘global networks’. A supportive wider environment appears to be a crucial factor for the success of local initiatives.

Keywords: decentralized energy production; energy initiatives; citizen groups; energy neutrality; sustainable energy; prosumers

1. Introduction

The societal transition to a sustainable energy system requires the transformation of communities and neighbourhoods. The transformation of energy production towards a more sustainable and decentralized system is progressing very slowly in the Netherlands. In Europe only Luxembourg has less sustainable production capacity installed. National fiscal policies are at present far from conducive to small producers; the national energy policy is one of the major barriers to change. Large energy companies argue that we have to wait with renewable energy. They fear that their recent investments in large coal fired power plants will not be economically profitable any more. Furthermore, they argue that an exorbitant growth of renewables will reduce necessary back up capacity.
Nevertheless, many cities, towns and villages in the Netherlands have put together ambitious visions about how to become energy neutral, zero-emission or low carbon. How to turn these ambitions into reality? In this paper we investigate bottom up approaches to realize local transitions to energy sustainability.
In this respect, a recent phenomenon is that citizens take energy production in their own hands. More and more consumers produce at least part of their own energy; the affix 'prosumers' is used to describe this development of decentralized energy production. Local Energy Initiatives foster and stimulate this development, but many go a step further by founding local energy cooperatives. Is a paradigm shift occurring in energy production and consumption, from large centralized fossil energy plants to diversified decentralized sustainable production? In our research we follow local energy initiatives to answer questions about their effectiveness and possible impacts on the creation of a sustainable energy society.
Our key question is: How can local energy initiatives contribute to a decentralized sustainable energy production system?
Sub questions are: What are the activities, motivations and ambitions of local energy initiatives? What determines their effectiveness? What are the barriers they encounter? In short, we aim to better understand the position and possibilities of these local initiatives.
With our study, we try to provide three contributions to the literature. First is that we try to expand teamwork literature by investigating the hitherto uncovered local energy initiatives. So far, most research on teamwork is carried out in formal organizations. Second is that we use Actor-Network theory to find out how local energy initiatives are related to more overarching networks. Third is that this is the first study after local energy initiatives in the Netherlands.

1.1 Energy policy and energy activism

The idea that an electricity network should rely on central production in large plants situated far from individual consumers has taken hold in the last decades. Started out as small, municipally governed production facilities, energy producers have become ever-larger companies. The recent mushrooming of energy co-operations on a town- or even village-scale is quite remarkable set against the background of the international energy system.
The governance of energy production in the Netherlands first has gone from the hands of local and regional governing bodies to international companies. (Wolsink, 2012) Consequently, the influence of consumers, local and regional politics on energy companies has become virtually non-existent. However, individual choice for green energy has at the same time become available. In the liberalized EU energy market consumers can freely choose their energy provider, so they can 'vote with their feet'. Moreover, consumers can become producers or 'prosumers' by producing energy with solar panels or windmills. This has become an attractive option for a growing group of consumers.
The next step is to scale up from the individual to the community level and to establish an energy-cooperative, which distributes energy to his or her own community or region. This community option is witnessed by the already considerable and growing amount of local energy initiatives that has sprung up in several European countries in the past few years.
What are the drivers behind this surge of community activity? The provision and promotion of green electricity, the strengthening of social cohesion and the investment of revenues in the local community are strong motivations mentioned by these initiatives. In addition, many people encountered voice ideas about self-empowerment, wishing to become independent from large

energy companies.
This may reflect a latent wish for self-sufficiency or community autonomy. In the 1970s the concept of self-sufficiency was very popular in the environmental movement, but in the last 20 years this motive has not been very prominent in the Netherlands. However, Bomberg and McEwen mention it as a powerful motive for action in their analysis of Scottish energy initiatives.

1.2 Literature

Earlier research on community energy has been done in the UK, following the publication of a UK policy document entitled *Local Energy Communities*. Walker and Devine-Wright published several articles on this topic. ((Walker, 2008; Walker & Devine-Wright, 2008; Walker, Devine-Wright, Hunter, High, & Evans, 2010)). In Germany there has been qualitative psychological research by Schweitzer-Ries and Zoellner. (Schweizer-Ries, 2008; Zoellner, Schweizer-Ries, & Wemheuer, 2008). Citizen resistance to the siting of windmills attracted considerable interest as a research site; see for example Jolivet (Jolivet & Heiskanen, 2010).
Literature on advocacy groups, primarily in the United States, suggests that teamwork and internal democracy are important factors that influence the effectiveness of these groups. Our research takes up findings on leadership and teamwork (Salas, Sims, & Burke, 2005), which we apply to the Local energy initiatives. In teamwork literature, no research has (to date) been published on energy initiatives, as most research is carried out in formal organizations.

2. Theoretical framework

What theoretical approaches might help to explain the messy realities of energy policy and local activism? There have emerged several theoretical approaches that might help explain the realities of energy policy and local activism. For example, the concept of path creation seems promising to analyse barriers and incentives in the energy transition (Garud & Karnøe, 2003) However, we find that these approaches cannot fully account for the dynamics on the local level and the influence of citizens on the development and diffusion of technology. Moreover, we find these approaches lack a clear perspective on the role of moral agents, such as the members of the local initiatives in our study. Therefore we draw on concepts from Actor-Network Theory, which can help to explain local network dynamics as well as the possible impact of this phenomenon on the wider societal networks.

2.1 Creating new paths

Co-evolutionary theories draw heavily on the metaphor of a development path, which guides and restricts the development of technologies. Development paths are comparable with the 'trajectories' that Dosi postulated. Concepts such as path-dependency and lock-in describe the way in which it becomes more and more difficult to choose an alternative trajectory. This leaves open the question about the role of human beings in these technology paths. The concept of path-creation can be helpful to account for human influences. (Garud & Karnøe, 2003) 'Path-creation' is a metaphor to position activities that work to develop a new development path, especially geared to help new technologies become successful. To create such a new path involves a lot of risks in investing financial, human and knowledge resources in new technologies. How to foster and manage the development of a new path is described in Strategic Niche management, to which we turn in the next paragraph.

2.2 Strategic Niche Management

Furthermore, Strategic Niche Management (Verbong & Geels, 2007) (Verbong & Geels, 2007) (Verbong & Geels, 2007) (Verbong & Geels, 2007) (Verbong & Geels, 2007) could be helpful in analysing the impact of local actions on a system level. The route for influencing the energy system according to this theory is by protecting and managing niches or protected spaces. This is called Strategic Niche Management (SNM). In these protected spaces technical development is subsidized and regulations are set apart, until the products can compete on their own. This appears to be a top-down (policy) activity. Therefore, it is rather difficult to apply SNM to bottom-up or self-organized citizens groups such as local energy initiatives. ((Kirkman, 2009; Verbong & Geels, 2007)).
The concept of niches is in our view not appropriate for explaining self-organized initiatives on the

local level. Therefore, to better understand how 'agency' can be mobilized to change the energy regime in a sustainable direction we turn to Actor-Network Theory. In the next section we develop an approach, which can account for the bottom up path-creation by local networks of moral agents.

2.3 Networks of moral agents

'Agency' is a central concept in our framework, what can citizens do to change a system. Kirkman writes (Kirkman, 2009)that moral agents or citizens make ethical choices as an individual. However, these individual moral agents are hindered by 'limits of agency'; barriers are present both in cultural and political traditions and in the physical layout of our built environment. Moreover, the individual moral agent has little impact on his/her own. To gain more influence individuals could form a network:

'*form new centers for change, (...) building a network of like-minded human actors and alternative configurations of nonhuman actors in which the basic forms of more lasting and widespread changes might take shape*.' (Kirkman p. 254)

Drawing on Actor-network theory, local networks can be seen as being nested in global networks (Law and Callon 1992, p. 22-41), (Law & Callon, 1988). In their description of the development of a new aircraft in the UK, Law and Callon propose that the level of 'success' of a project is a function of the degree of mobilization of local actors and the degree of attachment of actors in global network. These attachments are not stable. A certain project or initiative can over time move around the figure when actors become more or less active and gain or lose attachments.

According to Law and Callon the degree of attachments that local actors have with the outside world or global network is an important factor that determines the success of the local project. Kirkman adds the possibility of linking up these local networks:

'*By carefully defining its relations to this global network the actors in the local network might safely lay the groundwork for a revolution*.

Another Actor-network approach uses the concepts of framing and overflowing. This framework is used to analyse resistance to wind energy in the Albi region in France. In our study we apply the literature about local networks to local energy initiatives. These initiatives are 'forming new centres for change', as Kirkman suggests in his contribution 'At home in the seamless web' (Kirkman, 2009). Kirkman expects that widespread changes can occur once local networks team up on a national or global scale.

So, instead of technological niches we propose to look at networks of moral agents as the locus of agency. In the next paragraph we discuss earlier findings on the factors that influence the activities and impact of local energy initiatives. We also incorporate recent empirical findings on local energy communities in our model.

2.4 Other findings on local energy transitions

An important finding of Walker ((Walker, Hunter, Devine-Wright, Evans, & Fay, 2007) is that the level of acceptance of energy production units is stronger when the unit is more open, participatory, local and collective. An important factor in this model is 'trust'; members of the local community have to trust the local initiative in order to support, or at least not oppose, the projects that this initiative wants to undertake. The absence of trust often leads to opposition to sustainable energy projects, as is shown in a number of studies into siting of windmills. ((Jolivet & Heiskanen, 2010)) Then, what factors influence 'trust'? A second finding of Walker is that the level of acceptance of energy projects is stronger when the unit is more open, participatory, local and collective. The notion of trust and the factors of openness, participation and collectiveness is included in our model, as discussed in the next section. A third relevant paper of Walker et. al. (Walker, 2008) presented an inventory of barriers and incentives to a successful outcome on the local level, see table 1.

Incentives	Barriers	Necessities
Local income and regeneration	Legal conditions	Key committed individuals or entrepreneurs
Local approval en planning permission	Economic and technical viability	Supportive local and/ or regional institutions
Local control	Need for extensive liaison	
Lower energy costs en reliable supply	Lack of funding –	
Ethical and environmental commitment	Barriers to market entry and network connection	
Load management	Setting up of collective management, billing and metering arrangements	
	Planning permission	

Tabel 1

Nijkamp ((Nijkamp & Ursem, 1998)) studied policies to promote sustainable energy in European cities. He identified five factors that are crucial in attaining successful implementation of local energy measures: technology ('hardware'); communication ('software'); social conditions ('ecoware'); financial requirements ('finware') and organization ('orgware').
When analysing non-profit grassroots organizations we find that the challenges they face mirror the factors Nijkamp analysed on the level of cities: Local energy initiatives also face financial challenges, such as finding sufficient funding. Organisational challenges include safeguarding continuity, exercising effective team leadership, and attracting membership. There is also a need for regular communication with their local environment and securing municipal and/or regional support. Legal procedures can be rather complicated for non-experts. Also, the members of these initiatives have to familiarize themselves with technological options. When comparing the two approaches it appears that the barriers and incentives of Walker and pentagram factors of Nijkamp show a considerable overlap.
We combine the approaches of Walker and Nijkamp with actor-network theory in a conceptual model that is used to analyse local energy initiatives in the Netherlands.

2.5 Citizens initiatives as a network

For our analysis we worked out a tentative model. We look at the initiatives as embedded and interlinked networks. The effectiveness of local energy initiatives we expect to be influenced by internal teamwork, activities on the level of the local project and the relations to the established networks on a regional or national level. On each level we focus on several factors that showed up prominently in our findings.

Local network (degree of mobilization of local network)
Team effectiveness:

- local leadership
- organisation and participation

Project activities :

- vision
- activities
- communication

Global network (degree of attachments to 'global' network):

- members' networks
- regional and national support system
- energy actors
- national policies (economic, legal and fiscal barriers)

According to literature, the *team effectiveness* will be stronger when the internal processes are functioning in such a way that trust and sustainable leadership are guaranteed (Salas, Sims, & Burke, 2005).
The project will be more effective if the level of activities and communication are higher, and when a strong vision is developed.
The *global network* (or wider environment) is more supportive if a regional support system is in place; energy actors are open to innovation, economic; and legal and fiscal barriers are identified and removed on a national level. Both actors in the energy system and political structures have to be in favour of small producers to create a stimulating wider environment.

3. Results of case studies and fieldwork

3.1 Method

In the past two years we followed the activities of 20 local energy initiatives in the North of the Netherlands. Fieldwork and qualitative interviews have been done to get in depth knowledge of the local energy initiatives. The interviews were transcribed, coded and analysed according to a coding frame. The coding frame was developed on the basis of the theoretical framework and first tried out in a pilot study. We also studied websites, documents and other communications of these groups.
The case studies primarily focus on the local energy initiatives, their ambitions, activities, and organization. This community groups have diverse backgrounds, but tend to converge as to their goal of promoting local energy production. They range from political parties, commercial ventures, and energy cooperatives, to Village Working Groups.
In table 2 we present an overview of the initiatives that form a part of our sample. In this section we present our preliminary findings, developed along the lines of the presented conceptual model.

3.2 Team effectiveness

3.2.1 Leadership

We found that in many instances the local initiators are individuals with a background in the fossil energy industry or the sustainable energy sector. Their motivation to act is the wish to contribute to the energy issues. Another common motivation is to preserve the local community and to foster social cohesion.
Local leadership was very important in the choice of vision, the level of ambitions, but also in the choice of organisation type. The initiators also for a large part determined the level of democracy within the initiative. For example, one local leader specifically set out to create an organisation with several working groups, actively including active local residents, such as schoolteachers, small businesses, and people with specific competences on communication, or finance. The initiator himself took up a modest role in the board of the initiative.

3.2.2 Organisation and participation

The initiators in the majority of cases formed a working group in close cooperation with the local village organisation. In some instances the organisational route was via a local political party.
Initiatives with active members, stimulating leadership and successful activities often went through a formalisation process after a period of 6 months to two years. The choice of formal organisations is between a society, foundation, a co-operative or a commercial business.
One of the initiatives grew in size from 5 to 25 active members in one year. This organisation set

up a foundation, a more formal organisation. Although a co-operative is a type of organisation in which members can collectively own an energy company, which is attractive to many local initiatives, the financial risks and legal difficulties in setting up such a collective business is a formidable barrier for many of the small initiatives in our study. The co-operations that were formed often chose to align themselves to a larger sustainable energy company, such as Greenchoice or Trianel. In one case, the commercial background of the local leadership stimulated the establishment of a BV, a commercial venture. In this case there is little internal democracy left, so it will be interesting to see if this organisation type will engender enough trust.

DEGREE OF FORMALISATION OF LOCAL INITIATIVES

- Working Group
- (attached to) Dorpsbelangen (village working group)
- (attached to) environmental groups
- (attached to) political party
- Vereniging
- Stichting
- Coöperatie
- BV

3.3 Project activities

3.3.1 Vision

The visions developed by the local initiative were different in scope and ambition. On the one hand the modest ambition was to stimulate the installation of solar PV panels in the village. After organizing one or two meetings in the Village Hall about the technical and financial aspects of solar PV, often resulting in a surge of installations in the village, the ambition was considered to be fulfilled and the group disbanded.
On the other end of the spectrum a local initiative has the ambition to become an energy neutral village in 2020. A tentative scenario of how to reach this ambition was developed.

3.3.2 Activities and communication

The level of activities on the local level has grown enormously in the past two years. Even in small villages meetings on solar energy or energy efficiency attract quite high numbers of people, ranging from 35 to 65 in villages of 100 to 1500 inhabitants.
Other activities are courses on energy efficiency, energy markets, and excursions.
The majority of the local groups create a website, a Facebook page, and often use other social media, such as Twitter.

3.4 Global network

The attachments of the local team to networks outside the local project may hinder or stimulate the local achievements. The challenge to the local network is to balance the global and local networks, such that their vision can become a reality. In a network approach there are no clear boundaries between ‘levels’, because every actor in the network is in turn part of other networks too.

3.4.1 Members’ networks

In the local initiatives we studied it was apparent that many members were engaged in diverse networks and brought in knowledge and opportunities these networks provided. The other way round it is expected that the ‘global’ networks change when moral agents bring in views and experiences from local energy initiatives or other sustainable energy advocacy groups.
Some examples of relevant job activities on regional or national level of agents in our cases:

- member of municipal board
- director of energy advisory business
- civil servant in province, energy policy in job description
- engineer with energy research institute
- policy advisor with national gas institute
- employee at regional support organisation, with energy as main focus

The local or municipal level – outside the initiative itself – is also part of the ‘global’ network.

Attachments on this level are of vital importance. In some cases there was considerable involvement from local businesses, farmers, hotels, camping sites or schools. These members can reach out to other small businesses, farmers, or the parents of schoolchildren to join the initiative and take part in activities. Other competences that members brought in were finance and communication.

3.4.2 Energy actors

The energy sector is dominated by a small number of large companies, primarily dependent on fossil energy. The interests of national grids are brought forward by the TSO's, also large companies. The existing lobbies of the fossil fuel sector prove to be very powerful and influential. Lately the discussion about the necessary modernization of the power grid has been framed as the 'fault' of the renewables. The view of the large fossil fuel sector is that would be wise to delay the growth of renewables. Another example of framing is to position the decline of the use of fossil fuels as a (lamentable) loss of tax income for the government, followed again by a plea to delay the growth of sustainable energy production. These views are not only put forward by the energy companies themselves, but also by presidents of Dutch national advisory boards – often former CEOs of large energy companies.
Sustainable energy actors are often smaller companies, specialised in one energy source, such as wind, biomass, or solar technology. These sustainable energy actors do not have the same resources for influencing national policies as the conventional industry has.

3.4.3 Regional (and national) support system

In our cases we actively worked together with regional support organizations. It is too early to draw conclusions from this part of our work. However, the activities of these regional organizations are very popular venues for local initiatives to meet each other, and to obtain information and advice. We expect that the better the local initiatives are supported, the higher the chances are that decentralized sustainable energy production can embed itself in the folds of the present central energy system.

3.4.4 National policies

Since a few years it is legally permitted in the Netherland to set up a new energy company. However, it is not easy for small local initiatives to do so. Furthermore, following the recent bankruptcy of the Dutch branch of Trianel, new rules have been implemented by the NMA. This caused all but one of the small cooperatives to discontinue their services. The only remaining co-operative is in the North of the Netherlands, where three provincial initiatives have founded a regional cooperative energy company, which can act as an umbrella organisation for small local initiatives. However, national fiscal policies still hinder the growth of cooperative ventures by levying energy (former CO2-) taxes on co-operative sustainable production. On the other hand, many fiscal and economic policies subsidize fossil fuel activities.
At the moment a new energy law is being prepared. A few minor points are changed in favour of small and cooperative local production. However, in other respects the new law is (even) further restricting and will even introduce new levies on small producers, such as an extra tax for the use of the grid. The national union of local initiatives (E-decentraal) is actively engaged in commenting on the proposals for the new energy law and mobilizes local initiatives to get their views across to policymakers.

3.5 Discussion

In theory there are many technological options for decentralized energy production, however, the actual choice is rather limited. Due to earlier debates about landscape the regional energy policy is very strict on local windmills. Only large wind parks in designated areas are permitted. This means that local energy coops do not have the opportunity to invest in a cooperative village windmill, which would bring a considerable income for the community. Biomass installations are restricted to farmers, so again this technology is not within reach of most local initiatives.
Compared to Germany and the UK the situation in the Netherlands is very restricting for local energy initiatives. This leaves the local groups only solar power as promising technology. The recent fall in prices for solar PV has helped to bring 'prosumerism' within reach. However, the feed-in tariff in the Netherlands is so low that it is very unattractive to feed electricity into the grid. Small-

scale biomass (wood pellets and woodchips) is another possibility on the individual level.
Due to fiscal restraints it is not possible to use electricity from a cooperative installation without paying taxes, including the former CO2 tax (now called energy tax). This is a considerable barrier for local energy initiatives; it practically restricts their operations to the individual level.
Consequently, small-scale installations in and on private houses, combined with energy efficiency measures, appear to be the only viable option at the moment. It is therefore not surprising that the majority of initiatives in our study choose this route.

Nevertheless, there is an active and growing group of local networks that can act as 'centre of change'. They increasingly cooperate on a regional and national level. New modes of organisation are developed to realize local visions.
In the next years we will follow this development, and hope to witness a transformation of the centralized fossil energy system into a sustainable decentralized energy production system.

Location	Inhab.	Description
Balinge (Midden-Drenthe)	110	A small village initiative with local leaders set up a group aimed at installing a system with biomass heaters and sun thermal installation. The group volunteers with the nature agency to maintain and prune a certain strip of wood on a monthly schedule. The harvested wood is burned in the biomass heaters. Communication activities, such as energy education in schools are performed as well.
Wessinghuizen (Stadskanaal)	28	Successful small-scale initiative plans to supply houses with biomass from the direct environment. Pellet- or woodchip heating on individual level.
Oenkerk	1800	Village initiative started in 2011, developed a mission to become energy neutral in 2050. Plans include collective purchase of solar panels, promoting energy efficiency and founding of a co-operation to produce sustainable energy collectively.
Groningen	200.000	In the city of Groningen the organisation 'Grunneger Power' was formed in april 2011. Grunneger Power is a co-operation, so the decision power ultimately lies with the members. Any profit will be invested in sustainable energy projects. A new development is that other local initiatives can attach themselves to GP, as a local branch. This would provide smaller initiatives with the knowledge and juridical strength of GP, without giving up their local identity.
Oldehove (Zuidhorn)	1659	The region of Middag-Humsterland is a national landscape in the municipalities of Winsum and Zuidhorn. An initiative to start a Local Sustainable Energy Firm (LDEB) in the village of Oldehove, with the intention to supply energy in the whole of Middag-Humsterland. The focus shifted further to supply energy to a wider area, including the municipality of De Marne. The initiative attracted funding from the ECG to set up an organization. A board was formed with experts from the region. Recently the decision to form a (BV) was taken, to provide the new firm with a solid economical base.
Makkinga (Ooststellingwerf)	1039	SLIM- subsidized project for three years. Activities include building solar thermal installations, promoting solar panels, village kitchen garden. Plan to incorporate energy from biomass plant on farm outside village.
Pieterburen (De Marne)	375	Duurzaam Pieterburen was formed out of a protest group called 'Pieterburen Tegengas'. Very active local leadership is performed, participating in Duurzaam Pieterburen, Dorpshuis Pieterburen.
Schouwerzijl (De Marne)	100	In the framework of the Village organization (Dorpsbelangen) a workgroup was formed, which organized a series of meetings about home insulation, solar panels and other new options to save energy and produce your own. The meetings were very successful and many installations of solar panels followed.

Westerveld (municipality)	19.176	A local political party, Progressief Westerveld, drives the initiative in the municipality of Westerveld. Recently a fund and action plan on community energy actions got adopted.
Hooghalen (Midden-Drenthe)	940	In less than a year, the initiative in Hooghalen grew from a small group of enthusiast citizens into a formal 'Stichting' with a board and five workgroups. Stichting Duurzaam Hooghalen created a network of local citizens and also mobilized other actors such as the Village Hall, the municipality of Midden-Drenthe, the local school and the regional welfare organization. Activities included a survey, a course called 'My insulation', energy market and solar panel project.

Table 2

4. References

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